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PENNSYLVANIA SLATE COMPANY.

DIRECTORS :

Augustus Wolle,
Robert H. Sayre,
Phillip Nathan,
William Chapman,
Charles Brodhead.

OFFICERS.

PRESIDENT,

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RETHLEHEM, PENN'A, 1865.

HUTTER, PRINTER, EASTON,
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C I R C U L A R
OF
THE PENNSYLVANIA SLATE COMPANY.

BETHLEHEM, Penn'a January, 1865.

This company is organized under a special and *perpetual* charter granted by the Legislature of Pennsylvania. The capital stock is one million of dollars divided into shares of \$20 each.

The property of the Company comprises one of the most extensive and valuable Slate Quarries in the United States, and about two hundred acres of land in Northampton County, Penn'a, so located about the Quarries that the same may be worked for centuries without exhausting the supply.

The history of the Quarry is briefly this: About twenty years ago, an Englishman named Wm. Chapman, came to this country, induced to do so by the extent and profit of the Slate business in England, and the expectation that it could be rendered equally extensive and profitable here. He explored the Slate Range from Maine to Virginia, *thoroughly*, and found but three localities which in his opinion contained the necessary requisites, of excellence of slate, proper geological formation and extent of vein. The one near Richmond, Va.; the second near Bath, Pa., and the third on the peculiar formation known as the Water-Shed near the Wind Gap of the Blue Mountain. Keeping his own counsel, he, without unnecessary delay, secured the three. The one near Richmond is in the hands of the rebels—the second, near Bath is the property of the Chapman Slate Company, and the third on the Water Shed at the Wind Gap is now owned by the Pennsylvania Slate Company, and of which Mr. Chapman is the General Manager.

The Chapman Slate Company was organized and established by the same persons who now constitute the Penna. Company. The Capital Stock was fixed at \$300,000 in shares of \$50 each. All of the stock that was sold by the original parties was *placed at par*, with such parties as James S. Mason & Co., and S. B. Vansyckel, of Phila., Josiah O. Stearns, Gen. Supt. Central R. R. of New Jersey, Robert H. Sayre, Supt. Lehigh Valley R. R., A. G. Brodhead, Supt. Beaver Meadow R. R., Edward M. Clymer, Pres. East Penn:

R. R., Sylvester Wolle, (late Principal of the celebrated Moravian Boarding School for Young Ladies,) and Robert P. Krause, and others, of Bethlehem.

These persons were mostly in positions to see the large movements which were going on in the Slate business, and had the business capacity to see that it was the "coming thing" in the commercial way. The advantage they received from their early perception of the commercial value of Slate is that their stock is worth triple what it cost and could not be bought at that price. That Company with twelve miles of cartage, to market, and without any return, as yet, from \$40,000 of capital set aside for manufacturing purposes, has already paid a dividend of 12 per cent. for the first six months, and is now earning the interest on over a million of capital, and with the proposed improvements it is confidently expected to earn six per cent. dividends on two or three millions. A Railroad is now in course of construction from Bethlehem to Chapman, which will enable the Company to work to still greater advantage and profit, the saving on transportation alone, estimating their business at two hundred squares per day, will be equal to seven per centum on their capital stock.

As to the Slate business, commercially considered, there can be no better investment. The demand, owing to high duties on tin and Welch slate, the high rates of exchange, and scarcity of shingles, is unlimited, and saleable at whatever prices producers may reasonably name. Three years of high duties, and high rates of exchange have accomplished what it would have taken fifty years of ordinary times to do—has satisfied the American public that there are American slate equal to the best Welch—and convinced our business people, of a fact long known to European citizens, that slate is not only the cheapest, but the best roofing material. Even at present prices good roofing slate are furnished to consumers at less prices than English or Welch slate or tin were, in ordinary times.

We are satisfied of the fact that slate, as a roofing material, has now such a hold on the public favor, that henceforth the only difficulty will be to supply the demand. Can that be done? We answer, not for years, perhaps never. There are places in Europe where four thousand men are employed in a single quarry. Caernarvonshire, in Wales, has a population of thirty-five thousand splitters and dressers. But English and Welch slate are produced at so great a cost, that we can undersell them in their own markets, and at a large profit to

us, the geological position and cleavage of our slate being such as to enable us to produce them at least one-half the cost of the foreign slate. This fact establishes the permanency of the business, for in Europe prices are well settled and subject to but slight fluctuations, so that in the improbable event of a glut in the market here, we would only have to send them to the European market to obtain our highest prices and realize the largest profits.

The slate business in this country, is truly in its veriest infancy. The Chapman Slate Company, occupying a Quarry which has only been worked a few years, are now the largest producers of roofing slate of any quarry in the United States, and yet their present production is only equal to about one hundred squares per day, and these the result of the labors of about eighty men. Eight hundred men, would thus be equal to the production of one thousand squares per day, which would realize the company four thousand dollars daily net profit. What will be the magnitude and profit of the business when ten times that number shall be occupied in producing slate in Northampton County? And yet that time *will come*, and the present generation will see the half of that number employed in the Quarries of the Pennsylvania Slate Company.

Orders are now pouring in to the Slate Dealers from Boston, New York, Albany, Philadelphia, Harrisburg, Pittsburg, Buffalo, Cleveland, Chicago, Cincinnati, Indianapolis, Detroit, Milwaukee and New Orleans, far beyond the capacity of existing Slate Quarries to supply. Persons in any of the above named places would take all that any one Quarry now produces, and pay the cash in advance to secure the contract.

Coal sells at \$5.00 per ton at the mine. Cost \$3.00. Slate sells at \$30 per ton at the Quarry. cost \$12. The demand for coal is fluctuating, that for slate increasing and unlimited. And yet everybody is frantic for Coal Stock, whilst Slate Stock worth double or triple any coal stock at present prices, has to be argued into the hearts of capitalists.

Coal stock, however, had the same experience thirty years ago. Those who *then* purchased coal, have realized hundreds of thousands from a few thousand invested in what was generally supposed to be a visionary scheme. The same history will repeat itself in Slate. The experience of Europe *will* be our experience, yet how few are willing to invest in confidence that history does thus repeat itself? Timber, Iron, Coal and Slate have each *had* their infancy in England—Timber may

be said to be among the things that were, commercially considered, but Iron, Coal and Slate, chiefly from their being substitutes for wood, are in the vigor of their prime. Is not *that* history repeating itself with us? Are not Iron and Coal in their prime with us, having become so in a single generation, for many of the pioneers in the coal trade "still live" and living, are millionaires?

Cannot "he that runs read" that Slate is yet in its infancy in this country and that its history will be repeated here? Do not the signs of the times manifest that *this* generation will see Slate take its place in the commercial line with Coal and Iron? The only *question* to be decided is, who shall be the persons whose perceptions of coming events, will make them the pioneers in the investment and millionaires from the result.

"I might have been *in* among the first, had I ever thought that the coal interest would become so great and so profitable in the United States" is the exclamation of thousands who now envy the owners their millions made in coal. We predict that every man who reads this statement and lives twenty years without buying interests in Slate, will make precisely the same regrets, or we have read the history of the past wrong.

We make the assertion, and *invite* investigation into the proposition, that with railroad transportation and one hundred and twenty men employed at their Quarries, the Pennsylvania Slate Company, can raise, prepare and send to market, *daily*, two hundred squares (fifty tons), and sell the same for cash on delivery, at \$4 per square *net profit*, or \$800 per diem. And even at this large profit, it can be furnished to consumers at less prices than tin roofing at its lowest prices. And as to durability, a good slate roof, well put on will last for a century, whilst a house-owner, with much surface of tin roof to look after, might as well employ his painter and tinker by the year, for he constantly needs their services.

The slightest investigation will satisfy the most timid and incredulous that Slate Stock is the most profitable investment now offering to capitalists. A *thorough* and critical examination will astonish the investigator at the certainty of the enormous profits it promises to capital and enterprise.

The Pennsylvania Slate Company have secured what they believe to be the best Slate Quarries in the United States, with the single exception of those owned by the Chapman Slate Company. These Quarries have been worked sufficiently

to exhibit a breadth of breast which will take centuries to exhaust. Taken *together*, as a roofing and manufacturing slate, they believe them to be second to none in the world. For facility of working, splitting and manufacturing, they cannot be excelled. This last is a great desideratum in Slate when we consider the large number of uses to which manufactured slate is applied in Europe and which same uses will follow here.

Mantels, Tiles, Billiard-beds, Cisterns, Copings, Coffins, Lintels, Door-sills, Window-frames, School Slate, Black boards, Table Tops, Counter tops, Stair ways, Flagging, Bath tubs, Sinks, are but a portion of the articles into which slate is manufactured. Hence the value of a good slate for manufacturing purposes and the certainty of its resulting in large profits to the producer.

There can be no greater error than the opinion that every slate opening is a *Slate Quarry*. Ninety-five per cent. of them can only be worked for a brief period, whilst tens of thousands of dollars have been expended in fruitless search for workable veins.

Slate must be quarried from an open cut, they cannot be mined or quarried from tunnels.

The geological pitch of all known quarries in America with five or six exceptions, is such, that after a few years working the uncovering becomes so expensive that they must be abandoned.

The Slate at the Pennsylvania Company's Quarries lie parallel with the surface, with a broad breast already exposed, (which is worked toward the mountain,) fully demonstrating that the pitch is southward, and running to the surface toward the mountain (northward), establishing the fact of an unlimited supply of merchantable slate.

All that our company need to enable them to make dividends of from ten to twenty per cent. upon the *full amount* of their capital stock are facilities for getting their slate to market. They have now to be carted sixteen miles at a cost of \$1 per square or \$4 per ton. Were the projected railroad (Lehigh and Lackawanna) from Bethlehem to the Del. Lack. and Western R. R. at Stroudsburg completed, we would have but two miles to cart or build a branch railroad, which the company would speedily build out of their earnings. We could then get our product to market at a saving of at least fifty cents per square or \$2 per ton, being a gain of \$100 per

day or \$30,000 per annum, equal to an addition to our dividends of three per cent.

This company, during the past year, sent specimens of their slates to Edinburg, Glasgow, Liverpool and London, which were received with great favor, and were immediately followed by a large order from a Liverpool firm. We believe this to be but the precursor of large future orders, which at present rates of exchange, will realize us from six to eight dollars per square. Slate will never fall from present prices, even when we return to a gold basis, and then, the cost of production being less, our profits will yet be as great or greater than at present.

The January (1865) inventory of this company was as follows :

One large Brick boarding house.	Two Hoisting apparatus.
One two-story Slate Dwelling House.	Railway, Cais, Wagons, horses, carts,
Two two-story Frame Houses.	&c., &c-
Twelve new two-story Frame Houses.	Two hundred acres of land, and farm
Blacksmith Shop and tools.	house and farm building, all entirely free
Barn and Stable for quarry teams.	of incumbrance.

We are uncovering sufficient slate surface to enable us to produce at least fifty squares of slate per day during the coming season. This production will net us about \$200 per diem. We will steadily increase our force so that when railroad facilities shall be completed for us, we will probably be prepared to produce two hundred squares per day. If we fail in this, it will only be because we cannot procure the requisite labor.

The grading of the road is now under contract from Bethlehem (on Lehigh Valley and North Penn. R. Roads) to the Wind Gap, within two miles of our Quarries, and we are assured by Mr. Brodhead, the President of the Company, that the whole road will be ready for the iron superstructure by July 1st, 1865.

A very large trade will also be secured to the road at the Gap from the country beyond the mountain, equal to fifty tons at least per day, which with our trade will be amply sufficient to pay running expenses, repairs and interest. Eleven miles more of road, from the Wind Gap to Stroudsburg will complete the connection between Philadelphia, via the North Penn., Delaware, Lackawanna and Western and New York and Erie Rail Roads, making the shortest route by several miles from Philadelphia to Lake Erie.

For an exposition of the proposed connections of this railroad, we refer to an article from The United States Railroad and Mining Register, which is appended to this circular.

As was heretofore mentioned, Mr. Chapman is the General Manager of the Company. He is beyond all question the most experienced quarryman and most thoroughly educated man in all the various details of the management of Quarries, in the United States. A great deal of the success of enterprises depends upon the manner in which they are managed, and we feel that in that respect Mr. Chapman has no superior.

[*Extracts from The U. S. Railroad and Mining Register, Phila., April 16, '64.*]

* * * * * I suggest that the true way for Philadelphia to reach the Upper Delaware, the Lackawanna, Niagara Falls and the Northern Lake region, and for you to vindicate your own judgment and bring your own plans to a magnificent fruition, is to stand by the "old flag." Let the friends of the city and of the North Pennsylvania unite on the proper project, and with but little effort the Fourth of July, 1865, may witness a train of cars running over a six feet guage from Philadelphia to Lake Erie at Buffalo, with 22 miles less of distance than the Lake is reached by the Philadelphia and Erie Railroad.

This can be accomplished by the completion of the Lackawanna & Lehigh Railroad, from Bethlehem to Stroudsburg, a distance of about thirty-six miles, through the Wind Gap of the Blue Mountain. The road was authorized to be extended to the Lackawanna road, by supplement passed this winter. * * * * * A large number of men are at work on it daily and about four miles are already graded. (Now January 1865, 20 miles.) * * * * * At the Wind Gap the company expect to intercept a large local business from the heart of Monroe county, which is now divided between Easton and Stroudsburg, and carry the same to market to Chapman, Bath or Bethlehem on their own road, or via the North Pennsylvania Railroad to Philadelphia. * * * * *

To that point (Wind Gap) local interests (principally slate, limestone and iron) will construct the road.

But eleven miles then remain to connect the city of Philadelphia with the Lackawanna and Lake regions, over a railroad wherein she has a million and a half of dollars invested, and by a route *twenty four* miles shorter than the present (Belvidere Delaware Railroad) route. Were this connection made, who can doubt over which route the tide of travel and business would flow, and what treasury would receive the golden proceeds?

But look beyond the Lackawanna, and behold what a vista for enterprising Philadelphia merchants and the non-dividend receiving holders of North Pennsylvania Railroad stock, opens up to the view. Estimate the vast amount of trade and traffic that *such* a country *could* send into a city like Philadelphia were the facilities of a nearer route offered to its choice.

Take your map and look at the wonderful expanse of populous and productive country, north, east and West of Elmira, the business of which makes Elmira a common starting point, and which will, of course, take the shortest and best route to market. Calculate the immense trade of the lakes, which can as well be taken to the wide guage railroads at Dunkirk or Buffalo as to any other point, and which from Buffalo could reach Philadelphia without change of cars and by the shortest route from the lakes to the city over the North Pennsylvania Railroad—adding to its earnings, and doubtless enabling it to pay dividends on its stock, and thus realize a hundred thousand a year for the city treasury.

TABLE OF DISTANCES.

Elmira to Philadelphia via Great Bend, Belvidere & Trenton.....	289 miles.
“ “ “ Williamsport and Catawissa and Philadel- phia and Reading Railroad.....	275 “
Elmira to Philadelphia via Catawissa, Quakake, Lehigh Valley and North Pennsylvania Railroad.....	281 “
Elmira to New York.....	274 “
“ Philadelphia via Delaware, Lackawanna and Western, Lack- awanna and Lehigh, North Pennsylvania Railroad.....	265 “
Philadelphia to Lake Erie via Phila. and Erie R. R.....	447 “
Philadelphia to Lake Erie, at Buffalo, via N. Y. & Erie, Delaware, Lack- awanna & Western, Lack. & Lehigh, and North Pa. R. R.....	425 “
Lake Erie (Buffalo) to New York.....	434 ¹ “

Thus it appears that the North Pennsylvania and Lackawanna & Lehigh Railroad route will have an advantage of 24 miles over the Belvidere Delaware, in reaching the lakes, and will connect Philadelphia with Lake Erie by a route 22 miles shorter than the Philadelphia and Erie Railroad, and Philadelphia will be nine miles nearer as a market to the immense trade which centres at Buffalo than New York City itself. * * * * It wants but \$600,000 and a third rail on the North Pennsylvania from Bethlehem to Philadelphia, and the thing is done. Why can it *not* be done? You raised six millions for fifty miles of road; pray give us your good efforts to raise the one-tenth of that sum for thirty six miles, and thus make the original fifty miles effective, and the whole investment a profitable one. * *

Stroudsburg is but ninety miles from Philadelphia by this route, whilst it is 114 by the present Bel. Del. Railroad. Let the North Pennsylvania men estimate the extra cost of continuing their trains, when once under way, to Stroudsburg—calculate the probable number of passengers and amount of other business they would carry to and from that point, and then determine whether the connection is desirable.

[From the “*Moravian*” (*Moravian Church Journal*), May 19, 1864.]

OUR MINERALS AND SLATE.—An excursion into the country up the valley of the Manocacy, undertaken by us a few days ago, caused us to reflect upon the prospects of material prosperity opening upon this section of our State. Every day seems to be developing our resources and bringing to light the treasures stored away in the bosom of the earth. In addition to the capacity of our soil to produce breadstuffs, of which one gets a very realizing sense in passing through the fertile fields of the “Irish Settlement,” we thought of the inexhaustible beds of coal, and iron, and zinc, and limestone, with which this country is blessed, and which are sufficient to supply many thousand furnaces and give employment to millions of workmen, and can not doubt that these things must ere long attract a vastly increased population into the valley of the Lehigh and its tributaries.

The valley of the Manocacy appears to be not a whit behind that of Saucon and the Little Lehigh in valuable mineral deposits. As we passed by General Shimer’s Farm, we had occasion to notice that iron ore lay in considerable quantities along the wayside, a sure indication of its existence in the soil and accordingly we were not surprised to hear that discoveries of excellent hematite are of frequent occurrence all along the line of the new (Lehigh & Lackawanna) Railroad, that penetrates this valley as far as Chapman. Limestone, a no less necessary requisite for smelting the ore, is also found in abundance.

One of the most promising fields of productive industry, is that however, which lies just beyond the limestone formation of our country, in the slate region. Here are the slate quarries of whose importance comparatively little is yet known to the public, but which are probably destined to create as valuable a branch of commerce as any mineral in our State. It is well known that the Slate Quarries of England and Wales are a source of vast wealth to that kingdom, and furnish employment to tens of thousands of workmen. Quarries of this mineral have been operated elsewhere in our country at many places, some yielding a material well adapted for all the uses to which it is put, whilst others have brought its use for roofing

into disrepute, by furnishing slate that loses color or disintegrates under the action of the weather. In general, the strata of marketable slate in our country have been quickly exhausted or been worked to disadvantage. The only quarries yet discovered in our country that meet all the conditions of successful mining and long continuance at remunerative prices, are those in the upper section of the Manoeacy valley, and the best of these lie a few miles beyond Bath, at a place named after the original proprietor, "Chapman." Here an immense bed of slate, of unknown depth, has been uncovered, lying in nearly horizontal strata, with natural seams and of the finest grit; and is wrought to so much advantage that the article could already be exported to the old country at good paying prices. The quarry consists at present of an opening about one hundred feet in depth, as many feet in width and 150 in length. About 80 hands are at work, having recently had an accession of nearly thirty men from England, whence a still greater force is expected. The quantity of slate employed for other purposes than roofing is still very insignificant (and the demand for roofing alone exceeds the supply,) but as the facilities for production increase, the uses to which the article will be put are numerous. Until now the business is in its infancy, but we foresee that the town of Chapman must grow rapidly and in less than ten years may count its population by thousands.

The machinery and structures of the works have all been designed by Mr. Wm. Chapman. We were forcibly struck by an extraordinary and unique device he has adopted to hoist the massive blocks from the quarry. It may be called a portable inclined chain-railway, and consists of a double chain and tackling worked by an engine, which is let down to any spot in the quarry and raises therefrom to the upper surface without the necessity of much handling, large masses of the stone, weighing from one to five tons. It is an original contrivance of Mr. Chapman's which will hereafter be of invaluable assistance to all engaged in deep mining. We would recommend the curious to pay a visit to this interesting locality.

Slate Quarries as an Investment.

The public generally, it is to be feared, are entirely unacquainted with the mysteries of slate quarrying; and although some attention has lately been paid to the subject, the difficulties encountered by those who have a prospective feeling that quarries would be a very valuable investment are greatly increased by their own want of personal knowledge on the subject, and their inability to find any reliable source from which such knowledge can be acquired. It is hoped, therefore, that a short series of articles in the *Mining Journal*, as the recognized organ of public opinion on mining matters, may somewhat relieve this difficulty. They will state in the clearest and shortest manner possible all the facts which the writer, after many years of practical experience, may think would be acceptable to those who are seeking an investment in quarries.

Mines of gold, silver, lead, iron, copper, tin and other metals, have all acquired a firm standing in the public market. Why slate quarries and mines (for they assume both characters, being worked from the surface in Carnarvonshire, and underground in Merionethshire) are only just beginning to be known may seem a matter of wonder, but they are, in truth, only in their infancy, for Lord Penrhyn's quarry (now Col. Pennant's) was only opened some 60 years ago, and it is the oldest quarry in Wales, while general mines have existed in England from the most remote ages.

With regard to the present state of the slate trade, two leading facts may be taken for granted:—1. *That the demand for slate is now more than three times in excess of the supply.* 2. That the late general tariff reduced the old absolutely prohibitory importation duty of slates into France to an average duty of from 8d. to 10d. to a ton. This reduction of duty opens all the ports of France to our slate traffic. The development of it must be gradual, but it has already had a satisfactory commencement.

The internecine civil war in America has for some time very much reduced the exportation of slates to that continent; but, notwithstanding that reduction, the demand and supply are now relatively the same as they have just been stated. Our own country, however, in which the old-fashioned tiles and straw thatch of the country cottage are rapidly giving way to the slated roof, is the surest and safest market for our home productions; but even should this fail, which does not appear possible, the new world, as soon as she has emerged from her own troubles, would *alone* redress the balance of the old.

The great argument for slates in preference to any other roofing substance in every part of the world is founded on the following amongst other points:

1.—Their lightness *per se*, which renders much lighter and consequently, much less costly the timber necessary to support the roof.

2.—Their lightness *for carriage*, so that they can be transmitted by sea or railway much cheaper than any other roofing material

3.—Their durability; no instance has ever been known since the establishment of slate quarries where a slate roof has been required to be renewed, unless, perchance, through an accident by fire or tempest.

4.—Their neatness—perhaps it might be called elegance.

With these few preliminary remarks, let us now proceed to our main subject, which, it is hoped, may be of use to those who feel inclined to embark in quarry investments, and let us notice—

THE SELECTION OF A QUARRY.—Many points are involved in this, but before I mention them I think it better to give a caution as to one thing which it is better to avoid, and that is an *effete* quarry. It may have become such either as an originally good quarry fairly worked out, or (as is most frequently the case) from no satisfactory bed of slate having been developed after it has been extensively worked. In the former case it has altogether ceased to be an investment; and in the latter, no one can make it pay but a man who has been constantly employed *at that particular quarry*. He knows where the kernel is, as well as how to pick it out, and he may make a hundred or two a year out of it, while it would be worse than worthless to an investor. With this caution, let us see how a proposed new quarry ground is to be selected.

The first principal point will be to make an accurate inspection of the surface, with a view to the indication of the slate vein. In making this inspection, it is of no use to be accompanied by a scientific geologist; a practical, honest quarryman knows more of the appearance of the genuine laminating slate rock, and of its most promising features for every working purpose, than all the members of the Geological Society put together. It is desirable that the quarryman selected for the inspection should have passed his life *in the same district* in which you propose to make your inspection, and that he should be prepared with a hammer and splitting chisel, in order that you may be satisfied with the true lamination, or splitting character, of the rock you inspect. You cannot generally make a safe inspection without a strict attention to these two points, because there are so many untrustworthy inspectors, and so much of what is called bastard rock, resembling to an inexperienced eye the true slate vein, that the two cautions given appear to be really required; honest quarrymen, however, can be found. The lamination of true rock can often be ascertained without the assistance of a hammer and chisel, and may be known by its having been split (perhaps this word is better for general readers than laminated) into pieces as thin as the finest wafers by the action of the weather on its surface. Having ascertained that the rock is good on the surface, *it may be taken for granted that it is good for any depth below*, as the deepest quarries yet worked have never found its bottom.

The following are the colors and qualities of the slates made in Wales, arranged according to their several values, of which a full price list for the time being will be given before these articles are concluded. *Perhaps it is better to state now that the price of all qualities and colors of slates has been raised 25 per cent. within the last five years*, and that during the greatest panics in all other marketable commodities the demand for and price of slates have always kept firm. 1. Green. 2. Blue. 3. Red. All these have as well as pure best second and third qualities, also spotted and striped of all three qualities. The green slates have not by any

means the same call as the rest; and, indeed, if they had it could not be answered, as the make of them is *very* limited. They have been used for one or two highly ornamented churches, and they may be seen on the roof of the New Museum at Oxford, and on a few other buildings in other parts of the kingdom, where decorated roofs are considered consistent with architectural unity. These several purposes, for which they are eagerly sought, keep their price much ahead of all other slates; and it ought also to be added that all slates of that color sell at one uniform price, without distinction of best or second qualities, and that their uniform price is much in excess of the price for which even the best blue slates sell.

With the vein thus ascertained as to the extent, color, and lamination, it seems almost superfluous to remark that the more extensive the tack the more extensive will be the quarry, but it may be as well to add it would require a good slate vein, of not less than from 10 to 15 yards in width, to make a fairly paying quarry. This is assuming, however, that there is only one vein within the tack, although it generally happens, even in the very best quarries in Wales, that there are many veins, and that too, often of different colors, separated only from each other by slight or greater faults. Some of Col. Pennant's quarrymen went to the steward some years ago saying that they had come upon hard rock, and that the *red* slate vein on which they were working was at an end. After boring, however, through some 3 or 4 yards of rock, they struck a true *blue* vein; this was in depth, and is, it is believed, the only instance of such a fact on record.

LET US NOW LOOK TO THE SITUATION OF A QUARRY.—At present we will only notice the principal points, leaving further remarks on them to our next article.

1. The most easily worked quarry is on a hill side.
2. It is desirable to have a quarry not very far from a railway and port.
3. If you can, get water-power.
4. Take care to have sufficient waste room.—*London Mining Journal*, Dec. 3.

THE SLATE QUARRIES OF WALES.—The activity which has characterized the slate trade of the Principality for the last few years still continues, despite the opening of a great number of new quarries, and the extension of old works. As an instance of the development of the trade, it may be mentioned that 76,000 tons of slate were shipped from Portmadoc in 1863, against about 10,000 in the year 1834. This is from the district known as the Vale of Festiniog alone, and the shipments from Bangor and Carnarvœ have increased in almost an equal ratio. The demand is so brisk at present for good slate that buyers have, as a rule, to wait about twelve months before their orders are executed, and there is no doubt that double the yield of the quarries at work could easily be disposed of. Many new companies have been promoted, with the view of opening fresh ground, but at least three-fourths of the schemes have collapsed, owing to bad management, faults in the rock, or some other unfortunate cause. In one instance the whole capital of the company, amounting to £50,000, was spent in purchasing the royalty and plant, and making experiments, and it turned out in the end that there was no vein of slate in the property. This shows the necessity of caution on the part of shareholders, as the statements put forward by interested promoters can not in the least be relied upon. Slate quarries, like other mining operations, require no ordinary foresight and management to ensure success.—*London Times*.

SLATE QUARRIES IN WALES

CONSIDERED AS AN INVESTMENT.

*[Reprint of a Pamphlet on this Subject, printed in London in
1864.]*

THE PREFACE.

THE Author, in appearing before the public in a Third Edition of this little work, does so entirely at the request and suggestions of numerous persons in England and Wales, many of whom are Agents and Managers of Quarries, who kindly offered to supply information and reports from their various districts, and which are appended to the New Edition.

The original work was published about four years ago, and has been two years out of print; two Editions of 5000 each went off rapidly, and the Author feels a confidence in this, that it was the means of extending useful knowledge upon the subject, and of introducing a new source for highly profitable investment, which had hitherto almost been confined to private parties; more especially as the Free Trade principles had made their way to France, Germany, and many of the States on the Continent, and produced a rapidly increasing demand, that required an increasing supply to meet.

The Author, in reviewing the Original Edition, can see nothing to induce him to make any alterations; he believes the advice given, the plans proposed for opening and working a Quarry, and the prospects held out for good investments, if judiciously managed, are principles and facts incontrovertible. He will venture to quote from a letter received from one of the largest practical Quarry Managers in Wales, who says:—"I have just received your little book on 'Slate Quarries as an Investment.' It is small but comprehensive, and will prove very useful to persons unacquainted with this description of property; the advice given is sound and good, and if attended to, under good practical management cannot fail to pro-

“*Ever* satisfactory results. The field here is wide and extensive,—plenty of “room for capital to be well employed, as the demand exceeds anything we have “ever known before.”

The Author, in the introduction of new matter, after a critical investigation of the reports and remarks appended, arrives at the conclusion that it is quite corroborative of the principles laid down in the First Edition; and he still urges

more strongly than ever that practical talent should be employed for the opening and good management of Slate Quarries, otherwise the chances are, the capital may soon be buried beneath the *debris*, and left for other parties, wiser and more skilful, to come and reap the fruits of indiscreet management.

THOS. COOPER SMITH.

15, FINSBURY PLACE SOUTH, E. C.

Slate Quarries in Wales considered as an Investment.

THE writer of these pages has had about ten years' experience in the management of slate quarries in North Wales, as an agent, a director, and a proprietor. He has had to contend with great difficulties and discouragements in the pursuit of his duties and his interest, arising generally from his not sufficiently understanding the Welsh language and the Welsh character; he has had also to contend against his own ignorance of the geological features and indications of the country, and of the localities best suited to the working of slate quarries.

An experience now of many years has in some measure lessened those difficulties; given him a practical acquaintance with those important points so essentially necessary to persons about to embark in undertakings of this nature. The result of this experience is a thorough conviction that there is no class of property with which the capitalist can deal, that offers so sure and so remunerative a profit at the present time as a good slate quarry, well selected and well managed.

There are probably but few countries that can vie with the Principality of Wales in the variety and value of its mineral productions, capable of supplying for ages to come an inexhaustible source of profitable investment to individuals, and of commercial and national wealth. The profits which have from time to time been extracted from the mountains of Wales have, in a great measure, been the result of private enterprise: many instances exist of men in the lowest ranks of life having obtained affluence and independence from these sources. The most useful and valuable minerals are to be found in abundance in various parts of the Principality, and it requires only capital and enterprising spirit to work them to great advantage.

The lead mines have probably attracted a larger amount of capital than any other of the minerals with which this country is the rich depository; in the counties of Flint, Denbigh, Carnarvon, and Cardigan, the Silver-Lead Mines have been highly productive since the days of Sir Hugh Myddelton, who from thence amassed a large fortune, chiefly expended in bringing the New River to London, which now supplies a million of the inhabitants with the best water that England can produce. The parishes and districts of Mold, Flint, Bagillt, and Holywell, are said to produce immense quantities of the Goleua lead; the Halkin Mountain, the property of the Marquis of Westminster, is likewise very rich in this mineral, and has afforded prodigious wealth to several adventurers;—one part of this mountain it is said, yielded to those concerned, in the space of a few years, upwards of a million sterling; the whole of this district for miles round is studded with lead mines and collieries. Smelting works have been long established at Flint and Holywell, for the reduction of the ores, and the lead markets at these places are considered the largest in Great Britain; they manufacture at the works more than

one-fourth of the lead made in the United Kingdom, the average of which is 50,000 tons annually, and give employment to several thousands of industrious labourers and artisans.

The object of the writer of this pamphlet is to draw the attention of the public and the capitalist to the opening of slate quarries in the Principality as an investment. A quarry is far less speculative than a mine, and, when well-selected and worked with judgment, never fails to realize a handsome return; this the writer will endeavor to show, in the hope that it may induce many who are seeking for an employment of capital that will pay better than the ordinary channels, to embark money in it.

Perhaps there never has been a time in the history of the slate trade, or within the memory of any man living, when the demand for slates has been so great as at the present moment.

There is not a merchant who has had dealings in this article, whether in London, Liverpool, Manchester, or any other part of England, who does not complain of the difficulty in obtaining a supply: contractors with whom the writer has been in communication have suffered severely from not being able to complete their contracts. One of the parties to whom allusion is made lately visited most of the quarries in North Wales, and scoured the quays of Carnarvon and Port Madoc, to complete his *order*, but he found to his great disappointment that the slates were all under *order*, and that his only hope of obtaining what he required was by leaving his own *order*, which might possibly be executed in four or six months; and this is no unusual occurrence, as the supply is not half equal to the demand.

One of the large quarry proprietors assured the writer, not many weeks ago, that their orders were so extensive that he believed they could not execute them in *twelve months*; and that he really could not see how the production could be increased unless new quarries were opened; and what surprised him most was, that some of our great capitalists did not come forward and invest in this class of property, as nothing could pay them better. Public companies, he observed, were constantly investing in mines, which are far more speculative, whilst they neglect this important and profitable branch of our national produce. The writer replied to these remarks by asking how the large quarry proprietors would act towards the competitor who might attempt to share a portion of their trade? His reply was—*that "no jealousy is now felt by any of us, as we find it utterly impossible to supply the demand; that we should be very glad to see the supply increased, other-wise a substitute may be found that might damage us much more."*

Let it be observed, that nearly all the large quarries are in the hands of private parties, who have from thence amassed princely fortunes.

Perhaps this state of things does not apply to any other article in the Queen's Dominions; it may in a certain sense be said to be a monopoly—it has no foreign competition to contend with. No foreign slates have ever been imported into this Kingdom, for few, if any, are produced on the Continent, and if they were, they would not find their way hither, as the local demand is too great.

Another reason may be assigned for this state of the slate market. At one time, the demand was confined almost entirely to roofing slates and slabs, the demand for which, within the last few years, has increased a hundredfold, every new building now being slated; and from a calculation recently made, it would require the whole present produce of Wales for thirty years to cover London alone; but besides the above uses, slate is now brought into an almost endless variety of purposes, far too numerous to specify—such as cisterns, chimney-pieces, paving, and all sorts of fancy ornaments.

Another most conclusive cause of the great demand for slates is, that it is one of the articles included in the new Commercial Treaty with France; the present duty for the admission of roofing slates into that country is fixed at four francs per thousand, and square tablets at ten francs per thousand, formerly thirty-six francs per hundred; and in addition to this, it is well known that large quantities of slates are annually exported to all parts of the world by our merchants, as ballast, where they find a ready market; indeed, it has been asserted, that our export trade could take the whole of the produce of Wales, if the prices were not so high. This is fortunate for the home trade, as there is no probability of a decline

of prices for many years to come; the tendency is still upwards,—a further advance will take place at the commencement of the coming year.

From what has been stated, it is evident that a large field exists for the production of this highly valuable article, now forming one of the staple commodities of our trade, and which from its beauty, colour, texture, and durability, has gained so large an amount of preference, that it has become the ornament of most of our modern buildings.

Large bands of slate-rock are still unexplored in various parts of the Principality, sufficient to employ millions of capital for ages to come. The great Bangor Seam, so well known to those who have visited the magnificent quarries in the hands of Colonel the Hon. Douglas Pennant, and the late Thomas Assheton Smith, Esq., is supposed to be about thirteen miles in length, extending from Aber to Nantle. A correspondent informs the writer, that there are many miles of this fine seam not yet touched: trials have been made in various parts of it, showing good slate.

In the Festiniog district, the seam of slate called the Festiniog Vein is supposed to be about seven miles in length,—here the great Welsh Company, better known as Lord Palmerston's Quarry, Huddart and Mathaws', Messrs. Hollands', Messrs. Grièves', Messrs. Cassons', and several others, are working at immense profits, and producing a class of slate famous for its colour, texture, and durability. There are miles of this vein still unexplored. It is not necessary to multiply cases; there are numerous other veins, some partly explored, others untouched and undiscovered, which offer the highest temptation to the enterprising capitalist.

To persons seeking a sound and profitable investment, there is no difficulty in satisfying themselves that, with a good selection, and good management, this may be found in the slate district of North Wales; and it is to be hoped that the facilities afforded by railway, will induce public companies and spirited individuals to embark in this highly remunerative branch of our national commerce.

To those who are unacquainted with the extraordinary profitable nature of slate quarries, the writer will quote from an article in the *Mining Journal* of September 10th, 1859, giving the returns from some of the quarries now working in Wales, mostly by private individuals, who have reaped large annual profits, and amassed colossal fortunes, and whose prospects are at the present moment, brighter than at any former period, from the fact of the demand being so much in advance of the supply:—

“The Penrhyn Quarries, the property of the Hon. Colonel Pennant, which have been established for seventy years, are said to be producing an annual nett income of from £100,000 to £120,000.

“The Llanberris Quarries, the property of the late Assheton Smith, Esq., are said to be making annual profits of £70,000.

“The annual income of Lord Palmerston's Quarries, is said to be from £25,000 to £30,000; and numerous other quarries upon the Bangor and Festiniog ranges that are giving to their proprietors from £5,000 to £20,000.”

Some of these magnificent properties are said to produce 10,000 tons per month.

From an estimate recently made by a highly respectable and thoroughly practical quarryman, it appears that slate-rock may be broken down and manufactured for market at 31s. per ton, the market value being from 40s. to 50s. per ton; and that with a capital of £10,000, it is estimated that 600 tons of slate can be made per month, producing monthly £1,200, or £14,400 expenses, royalty, cartage, and agency expenses, will yield a nett profit of £4,210, or at the rate of 42 per cent.; and these returns may be considerably increased as the operations of the quarry extend. Let it be observed that slate quarries once laid open, extend at the same time that they are yielding large supplies of profitable slate-rock for the quarryman's hand; so notorious is this, that many of our large quarries have been opened with but a small capital, and time has accomplished that which capital would have done in a much shorter period.

To such as are unacquainted with the slate trade, the mode by which it is conducted, and the general prices obtained, the writer will quote from a Circular is-

sued by one of the largest proprietors in North Wales ; and this may be taken as a sample of all the rest, for the great quarry-owners meet once a year to fix the prices for the ensuing year :—

	<i>Dimensions</i>		<i>Weight.</i>	<i>Per Thousand.</i>		
FIRST QUALITY.						
Princesses.....	24	by 14	Ton. Cwt.	£	s.	d.
Duchesses.....	24	12	3 10	9	10	0
Small Duchesses.....	22	12	3 0	8	10	0
Marchionesses.....	21	11	2 15	6	12	0
Countesses.....	20	10	2 10	6	2	0
Wide Viscountesses.....	18	10	2 0	5	12	0
Viscountesses.....	18	9	1 15	3	17	0
Wide Ladies.....	18	9	1 10	3	0	0
Ladies.....	16½	10	1 10	2	19	0
Small Ladies.....	16½	8½	1 5	2	6	0
	14	8	1 2	1	12	0
SECOND QUALITY.						
Princesses.....	24	14	4 0	7	12	0
Duchesses.....	24	12	3 10	6	12	0
Small Duchesses.....	22	12	3 5	5	0	0
Countesses.....	20	10	2 10	3	18	0
Wide Viscountesses.....	18	10	2 5	2	10	0
Wide Ladies.....	16	10	2 0	2	4	0
Ladies.....	10½	8½	1 10	1	15	0
Small Ladies.....	14	8	1 5	1	6	0

SLABS.

Sawn Slabs, various..... £2 15s. to £3 15s. per ton.

Sawn Slabs or Blocks to order..... 3 10 to 4 5 “

Planed on one side, 5s. per ton extra. On both sides, 10s. per ton extra.

Discount for cash, 3 per cent. on all Slates.

The above fanciful names, it is said, were given, in 1765, by General Warburton, and they are still adopted in most of the Circulars; but the trade generally recognizes them by the sizes.

During the late panic, when the prices of almost every article of commerce were reduced 20 per cent., the list-price of the various slate quarries suffered no diminution.

Let those who are desirous of embarking in property of this description take the proper precautions, and the writer ventures to assert that there is no other class of property that can be compared with it as a remunerative investment.

Mines may now and then turn up a prize, but they are few. What is the average of all the mines in Cornwall or Wales—good, bad, and indifferent? Is it 5 per cent. on the outlay?—and he must be a lucky adventurer that gets a prize. The writer has it from good authority that not one mine in twenty ever gives a profit; at the same time he does not wish to discourage mining, as we must have tin, copper, and lead; but it is better left to the adventurer who is ready to throw his money into a mine at a hazard, to see whether or not it may bring a prize;—what proportion of blanks there may be to one prize we have no statistical returns to guide us.

This comparison may show to the discreet and the wise, that they are much safer in a quarry than in a mine; in the one you have it open to the broad daylight, in the other it is all chance until you see the ore upon the dressing-floors.

The writer is desirous to fix the attention of capitalists and investors in the direction of slate quarries which have long been undeservedly neglected. Nearly all the good quarries in Wales are in the hands of private parties, who are making enormous returns and large fortunes, which, in the hands of well-governed com-

panies, would yield the shareholders large dividends. The field for enterprise is extensive; the mountains of Wales are rich with this treasure; it requires only a careful search and judicious management to make such returns as will bear comparison with any of the private undertakings that have accumulated such marvellous fortunes.

The writer will avail himself of this opportunity to say one word as to the best localities for slate quarries, and the selection of such as possess the best facilities for working. An error on these points would more than probably lead to disappointment: but the safer course to pursue would, no doubt, be to follow the beaten track, where so large an amount of success has attended the opening and working of quarries. The Bangor, Llanberria, Llanliffin, and the great Festiniog seams may be said only to have had a commencement of operations upon them; the unexplored ground, which may be traced for many miles, leaves no reasonable doubt but that these great bands of slate-rock may be capable, for ages to come, to furnish employment for the millions, and a rich supply of slate for commercial wants. That there are other large formations of slate-rock in various localities of the Principality there can be no doubt, and that Wales will continue to maintain its pre-eminence over every other district that has ever been yet discovered for the superiority of its slates as to colour, texture, and durability; it is the staple commodity of the country,—it is the land of slates; it is in the market for the world; and there is sufficient to supply that market, if capitalists and men of business will but bring their business habits and enterprising spirit to bear upon it.

It is highly important, in the selection of a slate quarry, that it should be on rising ground, as it affords much greater facilities for working, and consequently a great saving in labour, rails, wagons, and machinery; it is also highly expedient that ample room should be had for waste, as a large amount of *debris* always accumulates. The writer has seen quarries completely choked up with the waste; in one instance a plot of ground was obliged to be taken half a mile from the workings, a viaduct was built over the main road at a great expense, a railway laid down for the conveyance, the slate-rock and *debris* brought up from the quarry 60 yards below the level upon an incline and conveyed to the new ground: this of course entailed a heavy expense; but the quarry is a good one, it can bear almost any cost; it makes but a slight impression on its profits, for, with all its disadvantages as to working, it yields a princely revenue. The writer would, however, recommend that attention be given to this important point, that plenty of waste ground be at hand, or in time the operations may be crippled.

No doubt a great mass of slate-rock lies below the level; but when this point is arrived at, of course machinery must be had; but if the operations are commenced at 100 or 150 yards above, you have a large amount of slate-rock to remove before you reach the base of the mountain, that will place the concern in a position to bear the extra cost, probably without trenching upon its profits; for let it be observed, that the rock improves in depth, the pressure from above compressing the slate improves its texture, hardens the metal, and renders it more durable. *It is impossible to define the depth slate may attain; in this respect slate quarries appear to be inexhaustible.*

The writer's desire in these few pages has been to give a faithful description of the present position of the slate trade, and to show the utter inefficiency of the present workings to supply the general demand; the capabilities that exist for increasing the supply; the temptation that offers itself to the capitalist to compete for a fair share of this highly profitable and rapidly increasing trade, and the certainty of large and remunerative returns, if only common prudence as to selection and management be observed.

THE APPENDIX.

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SUCH has been the excitement created by the increased and increasing demand for slate of every colour and hue, of every size, quality, and character, since the publication of the first edition of this work, that it may be fairly asked, what has been done to supply the additional demand, produced in a great measure by the new arrangements so wisely entered into by our Government with most of the nations on the Continent, for a more reciprocal interchange of the produce of each country? besides which, the demand in England, Ireland, and Scotland, has greatly increased; the rage for building knows no bounds; at or near almost every railway station new towns are springing up, the houses of which are covered with the beautiful produce from the mountains of Wales; to this may be added the increased stimulant given to the demand by the ingenuity of our artisans, who are converting slate into a great variety of articles for use and taste.

The above causes have no doubt operated very strongly for an increased demand for slate quarries, and settlements have been taken up in almost every direction where the appearance of a chance existed of slate being found. Many new companies have been formed for this object, some of which are likely to turn out well, but have not yet had sufficient time to contribute to the increased demand, as most quarries take a long time to develop and bring into profitable results. Others have been formed and expired, like the will-o'-the-wisp, after the expenditure of their capital. One instance may be referred to, where a quarry was opened on flat ground; a narrow vein was known to run there, but which required machinery, railways, &c., to open, as they had no outlet for water or room for *debris*. Now, nothing on earth could have made a quarry, situated like this, with so small a vein, pay; and had a good, honest, practical manager been employed to direct the operations, he never would have allowed one quarter of the capital to be expended.

That an increased supply has found its way to the various ports in the Principality, is clear from the returns; but this has in a great measure been produced by the additional efforts made at many of the old quarries; the high prices tempted them to put on increased power to aid their efforts for increased returns; besides which, some fine discoveries have been made, more especially in the Festiniog district, where a new vein has been opened upon and tested, that is yielding well and likely greatly to improve as the operations extend. The property alluded to has recently changed hands; the sum of £120,000 has been given to the old proprietors for their interest. Many of the quarries around will benefit by this discovery.

Notwithstanding these extraordinary efforts, it has produced but as a drop in the ocean; the supply still falls so far short of the demand, that the pressure is as great as ever. The demand from France, Germany, Russia, Austria, Prussia, &c., flows in, and the home trade is still scrambling to get their orders executed, for which, in many cases, they have to wait six and nine months, and it is not probable this voracious demand will be much alleviated for years to come. The fact is, the trade, from its earliest date, has been confined to a few private parties, who have enriched themselves. This monopoly has grown up under their wings; they have had no competitors to contend with, but the moment an increasing demand flows in, all the difficulties of a narrow policy are laid bare; they are unable to meet the requirements of an additional demand; *thus the trade will be crippled for thirty years to come, as it would take full that period before sufficient slate quarries could be opened to produce a supply adequate even for the present demand.* And what is there unreasonable in supposing the demand may double in a few years? Why, there is every reason to suppose that it will. Look at the taste of the age;

the rapid increase of the population and buildings; nearly all of which have thrown over the good old tiles, which have served them so long and so well: From the mansion of the noble to the cottage of the artisan, houses are adorned with slate roofs. And where can the foreigner look for or obtain an article of such beautiful colour and texture as the Welsh slate? We may therefore come to the conclusion, that the demand will go on increasing.

Now, what are the prospects for the future? Many new companies have been formed, with the object of opening and working slate quarries. Some of them have failed, others are in a better position, with good and promising prospects, and there is ground for hope that many of the old quarries and some of the new ones may lend their aid to increase the supply. The Diphwys Quarry, in the Festiniog district, which is the oldest in Wales, is likely largely to increase its returns from the new discovery; and the Newborough, Llechwedd, Votry, and Manofferan Quarries are spoken of as highly promising. The Wrysgan Quarry, which has been opening its way to fame for some years, is working with great vigour, laying bare its slate veins, which are of great extent, very promising, and likely shortly to be sending large quantities of slate to market. The Rhossydd Quarry is also working vigorously, and likely to be making good returns immediately.

The Croiser Quarry, a new undertaking, opening on the Moelwyn Mawr Mountain: The works are very extensive, and show signs of great promise and success; and of becoming one of the largest underground slate works in the Principality; they are conducted with great skill, under the superintendence of a first-class practical management.

The Moelwyn Mawr Quarry, on the same mountain, is opening by the Welsh Slate Company (Lord Palmerston's), with highly encouraging prospects of success. The chances are much in favour of this property under the good management it will have, and may become in time another tributary stream to the general supply. Other small quarries are making trials on or near the same mountain.

The Great Moelwyn Quarry: These works are upon a large scale, although the quarrying department is not so forward as would have been desirable to have seen it, considering the length of time the company has been formed; however, sufficient has been done to show that fine veins of slate run through the sett, taking their course partly from the Moelwyn Mawr and Moelwyn Bach Mountains. It is desirable these quarries should be worked vigorously, and develop their resources with energy. The district around is fired with a spirit of enterprise, and there is every encouragement to foster it, as the trials at various new undertakings show indications of unmistakeable success; and the prevailing opinions amongst many of the quarry agents in the neighborhood are, that those mountains may open up a wide field for profitable investment, and may probably, in a few years, vie with any of the large quarries in the district.

The quarries of the Welsh Slate Company, the Rhiwbryddir, Messrs. Hollands and Co., and Messrs. Greaves, are sending large quantities of slate to market.

The Nantlle Vale district also shows signs of improvement; many new quarries are opening there, amongst which is the West Dorothea, which promises early success and good returns. Many of the old quarries are greatly improved, as the Cilgwyn, Dorothea, Penybryn, Penyrsedd. Talysarn should be worked more vigorously, as fine veins of slate run through this sett.

The Bangor district is so well known, as contributing the largest quantity of slate for the market, that it is quite unnecessary to particularise the large quarries of Colonel Pennant and Assheton Smith as still improving and likely to increase their returns. Many new trials are making around the district, some with very encouraging prospects of success.

In the district between Festiniog and Barmouth, several slate veins have been discovered, and trials are making upon them in Transfyndd, Harloch, Llanfair, and Dyffryn, where a fine body of green slate has been discovered, and may be traced to Cwmmynach. At Corris the slate vein is very pure, but narrow. Bryneglwys Quarry has been a very successful speculation: it has recently changed hands for £28,000, and likely, at no distant date, to be sending large quantities of slate to market.

From the foregoing we may see there are some hopes, in the course of the next two or three years, of increasing the supply, but not to such an extent as to meet

the demand; there is still a favourable opportunity for the enterprising to come forward and develop the riches embedded in the Welsh Mountains.

It has been thought necessary to insist upon the importance of the employment of practical agents as managers of quarrying operations. The man who has been brought up in a quarry from ten years of age, with a pick and gad in his hand, knows more of a slate vein than all the professors in England. Such are oftentimes the freaks of nature, and the difficulties that occur from quartz veins, silk; veins, posts, &c., that they require the guidance of a master-hand to direct them even the man who takes the bargains requires a guide when they meet those difficulties, to enable them to overcome them to advantage. The theorist may give a fine lecture upon the course taken by slate veins, copper lodes, tin lodes, &c., but he cannot go into a quarry and direct the working of a slate vein. Here the labourer rises above him: it is not common-sense to suppose that any person unacquainted with the practical workings of the business can direct it. Where do we find a man succeed in the common walks of life who enters upon a business that he does not understand! Why, in nine cases out of ten, he loses his money. The greatest care and judgment is required in working a slate vein. It is a notorious fact, that some even practical men have been known to work a vein, and could not make it pay; and another has followed that has brought it into immediate profits! How is this to be accounted for? why, probably, by better skill, more attention, and greater care; this, of course, principally applies to poor veins. New quarries, at their first opening, seldom yield much pure slate, but as they get into depth, they improve. The average yield of quarries is about one-fourth of pure slate, when in good working condition; the waste is great in all these concerns, but the above proportion pays well.

The capitalist should bear in mind that an investment in Welsh Slate Quarries holds out such an inducement as no other article of commerce can do. It is the best slate produced in the world; it is not open to competition, for it is not to be equalled; no amount of slate is produced on the Continent, hence no foreign importation has ever reached this country, and the demand is likely to increase year by year. Enormous fortunes have been made and are still making, yet there is room for others to share in those brilliant prospects, if only common prudence and good management is well observed.

The following remarks as to the opening and management of Slate Quarries has been furnished by practical agents of the Principality. The advice appears to be so sound and good, that the Author readily adopts them, and inserts them, with every hope they may prove useful to directors and shareholders. The egregious follies that have been committed in some of the new companies from the want of the employment of respectable, practical agents, has extended, in some instances, to the total loss of the whole capital.

General Directions for Opening and Working a New Quarry.

In the first opening of a slate quarry it is of the utmost importance that it be opened in the most advantageous place, and in a proper manner. A mistake in the opening has proved ruinous to the success of many a company. Care should be taken to ascertain the dip of the rock, and the direction of the foot-joints, also the nature of the top of the quarry; the rock and earth overhanging the slate-vein ought to be taken into consideration, because that which is loose and small is more liable to fall and cause obstruction, oftentimes accidents, and very heavy losses; therefore this ought to be cleared to a greater extent from the opening; that is, the slate-vein ought to be laid bare to such an extent as to render the progress of the works safe from falls from the top of the quarry. The expense of removing the debris and loose shale must be regulated by the nature of the ground, and ought to be contracted for by the ton, and deposited where it would never interfere with the workings of the quarry. Slate making ought to be commenced as

soon as possible, and the best advice that can be given to public companies (who are oftentimes misled by reports promising returns sooner than can possibly be expected) is, not to spend their capital in erecting buildings, putting up machinery, making inclines, and laying down railways, until they have commenced making slates in considerable quantities, for this has been one of the great mistakes of public companies; also, instead of employing engineers who have no knowledge of slate-quarrying to draw out plans for opening and working a quarry; it would be very much better to consult a respectable, honest, and judicious quarry-manager. Several companies for working slate quarries have been formed within the last five or six years. Some of them are likely to prove successful; others, having commenced quarrying where no practical man would have recommended them, will be disappointed.

If the quarry is to be opened on the slope of a hill, a level ought to be driven across the vein at the depth of about 15 or 20 yards, in order to ascertain its width and quality; if satisfactory, then the quarry ought to be opened in galleries one above the other, each about 15 yards deep, commencing at the depth of the level. In some places the rise in the ground may not be sufficient to carry off the water without the aid of machinery; in that case, a level should be driven at the greatest depth obtainable to carry off all water from the quarry; a water balance would be required for raising the *debris*, &c.

If the slate-bed be situated on flat ground, the best mode of proving it is by sinking a shaft to the depth of about 30 yards; then drive a level in at that depth across the vein. It must be borne in mind that it is very much more expensive to open and work quarries on flat ground than on mountain-sides, owing to the necessity of erecting machinery for raising water, *debris*, blocks, &c.; and the slate-vein must be of excellent quality and good width to make it pay.

The above suggestions are so clear and plain to common sense, that a non-practical man may understand, in a fair degree, if matters are going on right; but a non-practical man cannot work a slate-vein—there are so many caprices and freaks in nature that occur in slate-veins, that none but a master-hand can guide safely or work them profitably.

The following Reports have been obtained from various quarry agents, as to the position and prospects of the quarries referred to, which in some measure shows the progress of those undertakings:—

BETHESDA is five miles from Bangor: There are three quarries in this district.

COLONEL PENNANT'S QUARRY is situated on the side of Clydir Fawr Mountain: It is supposed to have been discovered in the reign of Queen Elizabeth. The Penrhyn family derived one eighth royalty on all slates manufactured. In the year 1765 the number of men employed was 80, and a rent-charge of £1 per man per annum was made, which was considered equal to one-eighth. In the year 1782 Lord Penrhyn took the working of it into his own hands, and placed a number of men to clear and open the quarry more extensively, so that in 1793 he had 600 men employed. From that time to the present date the progress it has made, and the profits it has yielded, have been unequalled in the history of slate-quarrying. The number of men at present employed is about 3000; and the quantity of slates manufactured monthly is about 10,000 tons, which are conveyed to the port of Bangor along a tram-road made by the proprietor. Strangers visiting this quarry would be astonished at the immense mountains of rubbish deposited on each side of it. It may be here stated that the average quantity of slates manufactured from every ton of rock varies according to the purity of the slate-vein.

A good vein would yield from good blocks *one-fourth* in slates; but if we take into calculation the clearing of the whole body of rock good and bad, the yield in paying quarries ranges from one in twelve to one in twenty-five.

PANTREINOG QUARRY is near the town of Bethesda, on the opposite of Oywen River to Colonel Pennant's, this quarry has been worked for many years at a profit; 100 men are employed, and the make of slates is 300 tons per month.

BANGOR SLATE QUARRIES employ about 250 men; and before the late heavy fall, were manufacturing 600 tons per month. Several small companies have lately taken Tack Notes on different places on the Llanllechid Mountain, with the view of opening slate quarries, and the prospects in some of those places are very encouraging. The slates from the quarries of this district, (except Col. Pennant's), are carted to Bangor at the cost of about 4s. per ton.

LLANBERRIS QUARRIES are situated eight miles from Carnarvon. Here we have the celebrated Dinorwic Quarry, the property of the late Thomas Assheton Smith; under the able management of J. Millington, Jun., and G. Ellis, Esq.; it is the most improving quarry in Wales. Several improvements have been introduced of late, and the mode of working is more scientific than any in the Principality. An immense quantity of rubbish which had been deposited on the slate-bed is now in the course of removal, which will enable them to develop the quarry to advantage, and greatly increase the make of slates. The number of men now employed is about 2500, and the slates manufactured monthly is about 7500 tons, which are conveyed to Port Dinorwic by rail. It is almost unnecessary to say that this quarry and Col. Pennant's, yields the largest profits of any in Wales.

GLYMTRONWY QUARRY is on the south side of the Llanberris Lake; 150 men are employed, and the make of slates is from 300 to 400 tons monthly.

CEFNDU QUARRY is on the same side of the lake. It has been worked at a profit for many years by the proprietors: it is advantageously situated, and its prospects are good. Such a quarry as this ought to be worked on a more extensive scale. The number of men employed is 45, and the make of slates is 100 tons per month. There are several other quarries in this district which have not yet been developed, viz., Gal'tyllan, Goodmans, Cambrian, Glyn, Cook and Ddol, and Balchygraesne. All slates from these quarries are carted to Carnarvon at the cost of 5s. per ton, but a railway will shortly be made from Carnarvon to Llanberris.

NANTY BETTWS is five miles from Carnarvon, on the Beddgelert road; there are four quarries here. The Ganegfaw and Triflan are producing good slates, but they have not yet been developed, so as to yield any considerable quantity. On the opposite side of the Nant is Hafadywem. The number of men employed here has been reduced, and the make of slates does not at present exceed 30 or 40 tons per month. Castell Cidwm is on the shore of the Quillyn Lake, and has but lately been opened.

MOELTRYFAN lies between Bethos and Nadlle, where there are four quarries, viz.: Moeltryfan, Cwsbrynian, Braichrydd, and Vron. Moeltryfan is very advantageously situated; it was opened some years ago by a company, who spent a large sum of money in driving levels to prove it, but at last abandoned the project. At present it is worked by a private gentleman, who is likely to be more successful than his predecessors. The prospects at the present time are most encouraging; the number of men employed is 45, and the make of slates 40 to 50 tons per month. When a level which is now being driven has been finished, the make of slates will be considerably increased.

NANTLE VALE is about eight miles from Carnarvon. There are 18 or 20 quarries in this district, the slates from which are conveyed to the port of Carnarvon at a cost of 3s. 9d. per ton. The best quarries are on the north side of the vale.

CILGWYN SLATE QUARRY is one of the oldest, and, according to the extent of operations, one of the best paying quarries in Wales; 200 men are employed, and the present make of slates is from 500 to 600 tons per month. When the debris from the late fall is cleared away the make of slates will be increased to 800 or 900 tons per month.

DOROTHEA QUARRY is situated on flat ground, near the lake, and is worked by machinery; blocks, debris, &c., have to be raised from a considerable depth; but the slate-vein being of excellent quality, has been worked for years to a good profit; 370 men are employed, and the make of slates is about 800 tons per month.

PENYBRYN QUARRY is worked by machinery; and although they have reached a greater depth than any other quarry in the vale, the slates continue equally good in quality: 300 men are employed, and the make of slates is 600 tons monthly.

PENAROSEDD QUARRY is advantageously situated, being, like Cilgwyn, on rising

ground, with an extensive grant of land. It is now in course of being opened on an extensive scale by a highly respectable company; 450 men are employed, and the make of slates is 420 tons per month.

TALYSARN QUARRY is equal to any in the vale, but is worked on a very limited scale, and but few men are employed there.

COED MADOG QUARRY has not been worked, until recently, for 30 or 40 years. A company has taken it up, and lately commenced operations, and are making considerable progress. The quality of the slate is very good, and the prospects are most encouraging. There are other small quarries on the same side of the vale, but not worked to any extent. On the south side of the Vale of Nantlle, there are some quarries opening with great promise, and we hope to see the vulgar error, or rather prejudice, that has long existed against the probability of good quarries being discovered on this side of the lake, completely exploded.

WEST DOROTHEA, lately known as the Tyn-y-Werglodd Quarries: The prospects here are greatly improved since the new company has taken it up; they have worked it with great spirit, and the results have been most successful. Independent of the Green Vein, the slates from which have produced, on account of their beauty, colour, and even split, the highest price of anything of the kind in Wales, they have opened upon a blue vein of excellent colour and texture, and good width; 95 men are now employed, and the make is about 160 to 170 tons monthly; and if the prevailing opinion is correct, that this new discovery is a continuation of the Dorothea Vein, running from their sett under the lake into this property (and there appears to be no reasonable doubt of it), it may not be easy to estimate the value of West Dorothea.

TYMAWR QUARRY.—This has been at work on a small scale for some years, with promising indications, and small profits; it is deserving of more spirited operations. There is little doubt, higher in the mountain, they will take the Green Vein running from the Tyn-y-Werglodd Quarries. This would add greatly to the value of the property; 43 men are employed, and the make is 75 tons of slate monthly.

Several quarries are in course of being opened between Nantlle Vale and Portmadoc; large sums have been laid out in some of these trials, but as yet without any profitable results. This range is of a doubtful character—far more bastard rock than slate.

The FESTINIOG district has made rapid progress in the development of their quarries around the neighborhood.

THE WELSH SLATE COMPANY, better known as Lord Palmerston's Quarry, is supposed to be the most profitable in Wales owing to its extent, and the fact of the two quarries lying above it having to clear the top surface for Lord Palmerston's Quarry, and the rock, in consequence of the depth and heavy pressure, producing by far the purest rock of any quarry in Wales. This accounts in a great measure for the extraordinary profits made with so small a number of men. It is at all times difficult to ascertain the amount of profits these private companies realize, as they publish no accounts; but it is pretty well understood that they range somewhere about £30,000 to £40,000 per annum. The number of men employed is about 450, and the returns of slate about 2000 tons monthly. The labour-cost is about £24,500 per annum; the slate produces £2 15s. per ton. The return of 2000 tons monthly would realize £71,500, leaving the balance for dividends, royalty, and cartage. These returns are for thirteen months.

Rhiwbryddir returns about.....	1200 tons per month,
Messrs. Hollands' "	800 "
Llechwedd "	950 "
Rhiwbwh, with 127 men, returns about.....	400 "
Percivals " 200 "	450 "
Maenoffaran 90 "	70 "
Bangor and Portmadoc "	100 "
Cwmarchin..... "	120 "

DIPHWYS QUARRY is the oldest in the Festiniog district, and was sold last year to the present company for £120,000. The discovery of a new vein to the south

greatly enhanced the value of this property. The number of men at present employed is 250, and the make of slates 500 tons per month, with every prospect of greatly increasing the returns.

WRYSGAN QUARRY has made rapid progress of late towards a more extensive development of the property. They have two thick veins of fine slate-rock running through the sett, each upwards of one mile in length; it promises to be one of the best quarries in the district. A new tram-way or incline, 711 yards in length, is just laid down to join the Portmadoc line; this will facilitate operations greatly, and such is its advantageous position, that it may be worked at a moderate cost. It is chargeable with no royalty, but a clear rent of £160 per annum.

This property was bought by the present proprietors four years ago, including all the working plant, &c., for £2,750. A large offer, we understand, has been made for it—report gives it as over £100,000.

RHOSSYDD QUARRY, in the same district, is pushing on with great vigour, working upon a much more extensive scale, to develop her resources, and promises very profitable results; 160 men are now employed, and the make is 150 tons per month.

MOELWYN MAWR SLATE QUARRY: This quarry is opening by the Welsh Slate Company, on the west side of the Moelwyn Mawr Mountain, with good prospects of success. The vein exhibits some fine specimens of beautiful slate-rock, quite flattering to the feelings of the noble proprietors, who have recently visited the spot. The Croiser Quarry, which is opening on the north side of the Moelwyn Mawr Quarry is in a much more advanced state and promises to become one of the largest underground slate-works in the Principality of Wales. There are many other trials making in the neighborhood; there are extensive beds of slate-rock in the district, and should they prove profitable, it will open a wide field for slate-quarry operations in the locality.

THE GREAT MOELWYN QUARRY, in the same district as the foregoing, has now been in operation from four to five years, but no slate has found its way to market. There are some good specimens of slate-rock to be seen in the levels, and two fine veins of slate run through the sett, the one from a portion of the Moelwyn Mawr Mountain, the other from the Moelwyn Bach Mountain. The quarry is laid out for extensive working. A long incline is laid down to join to Portmadoc Railway, with all the necessary apparatus, but the quarrying operations are backward: a little more practical skill should be brought to bear upon it.

THE GLAN-Y-PWLL QUARRY, which has been much impeded in its progress by a long dispute as to boundary, has opened upon the slate-vein in the middle of the sett most successfully. The slate-rock exhibits all the characteristics of the slate produced at the other quarries; a good colour, even grain, and fine split. It is anticipated slate-making will commence in a short time.

In the district between Festiniog and Barmouth River we came across several slate-veins; and quarries are being opened in Transfyndd, Harloch, Llanfair, Dyffryn, &c. A fine body of green slate is found in this district. A quarry has been opened upon it in Llanfair; and a body of the same colour is to be found on Cwmynach and other places in this direction.

CORRIS, five or six miles from Machynlleth: The slate-vein here is very pure, but narrow, and the slabs are better for enamelling than those from any other quarries. Several small quarries have been opened on this vein.

BRYNEGLWYS QUARRY: This property was lately sold for £28,000; about 100 men are employed, and the make is about 100 tons monthly; but the quantity will be increased shortly.

The resources of the district between Dolgelly and Corwan have not yet been developed; but an excellent quarry has been opened on the Pale estate, near Llandderfel, and the slates are equal to any in Festiniog.

The above is a fair summary of most of the quarries in the Principality; it is a bird's-eye view of their position, situation, and prospects, and may be found useful to many unacquainted with the locality.

OPINIONS OF THE PRESS.

(From the *Mining Journal*.)

The author, who has been long engaged in Slate Quarries, has, in a few pages, brought before the public the position of the Slate Trade as one that recommends itself in the most tempting form to capitalists for investment. The leading features of this small Pamphlet go to show that the demand for Slate exceeds, at the present time, any former period; that the supply is utterly inefficient for the wants of the trade; that the prices are high beyond all precedent; that the profits realized by most of the large Quarry proprietors are upwards of fifty per cent.; and that extensive opportunities exist for opening other large Quarries and increasing the supply. But the work should be read to be appreciated.

(From the *Daily News* of April 17, 1861.)

To a Pamphlet entitled "Slate Quarries in Wales, considered as an Investment," Mr. Thomas Cooper Smith has added "A Short Description of the Present State of the Slate Trade." Mr. Smith has a peculiar claim to be heard upon this subject, having had ten years' experience of Slate Quarries in North Wales, as an agent, a director, and a proprietor. The result of his experience is "a thorough conviction that there is no class of property with which the capitalist can deal that offers so sure and so remunerative a profit at the present time as a good Slate Quarry, well selected and well managed." Mr. Smith observes:—"Perhaps there never has been a time in the history of the Slate Trade, or within the memory of any man living, when the demand for Slates has been so great as at the present moment. Nearly all the good Quarries in Wales are in the hands of private parties, who are making enormous returns and large fortunes, which, in the hands of well-governed companies, would yield the shareholders large dividends." The object of the Pamphlet, and of the interesting facts adduced, is to direct the attention of capitalists to this extensive and promising field for home investment.

(From the *Builder* of March 2, 1861.)

"SLATE QUARRIES in Wales, considered as an Investment;" with a short Description of the present State of the Slate Trade. By Thomas C. Smith.—The author of this Pamphlet states the result of his experience to be a thorough conviction that there is no class of property with which the capitalist can deal that offers so sure and so remunerative a profit at the present time as a good Slate Quarry, well selected and well managed. It appears that Slate-Rock may be broken down and manufactured for market at 21s. per ton; the market value being from 40s. to 50s. per ton; and that, with a capital of £10,000, it is estimated that 600 tons of Slate can be made per month; producing monthly £1200, or £14,400 per annum, at £2 per ton, which, after deducting working expenses, &c., will yield a nett profit of £4210, or at the rate of 42 per cent., the returns increasing as the Quarry opens and hence extends. Much of all this may be very true, and yet Slate Quarries be a questionable investment through difficulties in the way of getting honest managers. The author, therefore, may qualify his estimate as to

profits by the condition of proper management. We know of more than one case where the shareholders have been robbed of all, though the promoters and the lawyers made fortunes. We may one day tell a story as to the profit and loss in some Slate Quarry Companies.

(From the *Money Market Review* of April 27, 1861.)

SLATE QUARRIES IN WALES CONSIDERED AS AN INVESTMENT. With a Short Description of the Present State of the Slate Trade. By Thomas Cooper Smith. Second Edition. Published by Ward Brothers, 56, Partholomew Close and by the Author, 5, Warneford Court, Throgmorton Street.

This is a practical, sensible little Treatise, on a class of home enterprise which does not meet with the full attention it merits. The author is fully qualified to speak upon the subject, for he has long been engaged with Slate Quarries in various capacities, all of which gave him excellent opportunities for close observation. The result of his experience he declares emphatically to be that there is no branch of enterprise in which equally large profits are to be secured with little outlay and little risk. He affirms, and we think truly, that "there are probably but few countries that can vie with the Principality of Wales in the variety and value of its mineral productions, capable of supplying for ages to come an inexhaustible source of profitable investment."

(From the *Builders' Weekly Reporter* of April 29, 1861.)

SLATE QUARRIES.—In our advertising columns of this day appears a small Pamphlet on Slate Quarries, considered as an investment, by Thomas Cooper Smith. The Second Edition is now before us, and we can venture to assure our readers it is well deserving the attention of those who are looking out for a sound and profitable investment. Mr. Smith has been engaged in the trade for some years. The gist of his Pamphlet goes to show that the large Quarry proprietors are realizing profits on their capital of at least 50 per cent., and that the present time is one peculiarly adapted to tempt the capitalist to embark in this branch of our commerce, as the demand exceeds any former period, and the supply is insufficient. We cordially recommend the work to either large or small capitalists.

(From the *Limited Liability Companies' Journal*.)

We recommend this publication to the perusal of those inclined to embark in Slate Quarrying, of which we have, on different occasions, expressed our opinion as being amongst the best speculations of the day.



